Compact™ 1769-OB16 Solid State 24V dc Source Output Module

Installation Instructions

Inside

Publication 1769-5.4

Specifications

General Specifications

Specification	Value
Dimensions	118 mm (height) x 87 mm (depth) x 35 mm (width) height including mounting tabs is 138 mm 4.65 in. (height) x 3.43 in (depth) x 1.38 in (width) height including mounting tabs is 5.43 in.
Approximate Shipping Weight (with carton)	280g (0.61 lbs.)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Operating Temperature	0°C to +60°C (32°F to +140°F)
Operating Humidity	5% to 95% non-condensing
Operating Altitude	2000 meters (6561 feet)
Vibration	Operating: 10 to 500 Hz, 5g, 0.015 in. peak-to-peak Relay Operation: 2g
Shock	Operating: 30g panel mounted (20g DIN rail mounted) Relay Operation: 7.5g panel mounted (5g DIN rail mounted) Non-Operating: 40g panel mounted (30g DIN rail mounted)
Agency Certification	• C-UL certified (under CSA C22.2 No. 142) • UL 508 listed • CE compliant for all applicable directives
Hazardous Environment Class	Class I, Division 2, Hazardous Location, Groups A, B, C, D (UL 1604, C-UL under CSA C22.2 No. 213)
Radiated and Conducted Emissions	EN50081-2 Class A
Electrical /EMC:	*The module has passed testing at the following levels:*
• ESD Immunity (IEC1000-4-2)	• 4kV contact, 8 kV air, 4 kV indirect
• Radiated Immunity (IEC1000-4-3)	• 10 V/m, 80 to 1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier
• Fast Transient Burst (IEC1000-4-4)	• 2 kV, 5 kHz
• Surge Immunity (IEC1000-4-5)	• 2 kV common mode, 1 kV differential mode
• Conducted Immunity (IEC1000-4-6)	• 10V, 0.15 to 80 MHz[1]

1. Conducted Immunity frequency range may be 150 kHz to 30 MHz if the Radiated Immunity frequency range is 30 MHz to 1000 MHz.

Output Specifications

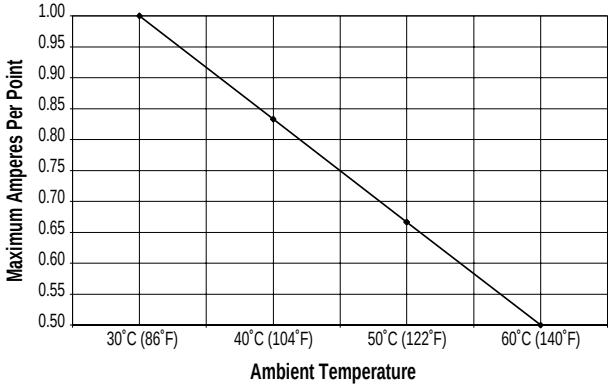
Specification	1769-OB16
Voltage Category	24V dc
Operating Voltage Range	20.4V dc to 26.4V dc (source[1])
Number of Outputs	16
Bus Current Draw (max.)	200 mA at 5V dc (1.0W)
Heat Dissipation	2.11 Total Watts *(The Watts per point, plus the minimum Watts, with all points energized.)*
Signal Delay (max.) – resistive load	turn-on = 0.1 ms turn-off = 1.0 ms
Off-State Leakage (max.)[2]	1.0 mA at 26.4V dc
On-State Current (min.)	1.0 mA
On-State Voltage Drop (max.)	1.0V dc
Continuous Current Per Point (max.) *See the derating graphs on page 13.*	0.5A at 60°C (140°F) 1.0A at 30°C (86°F)
Continuous Current Per Module (max.) *See the derating graphs on page 13.*	4.0A at 60°C (140°F) 8.0A at 30°C (86°F)
Surge Current (max.)[3]	2.0A (Repeatability is once every 2 seconds for a duration of 10 msec.)
Power Supply Distance Rating	8 (The module may not be more than 8 modules away from the power supply.)
Isolated Groups	Group 1: outputs 0 to 15
Output Group to Backplane Isolation	Verified by one of the following dielectric tests: 1200V ac for 1 sec. or 1697V dc for 1 sec. 75V dc working voltage (IEC Class 2 reinforced insulation)
Vendor I.D. Code	1
Product Type Code	7
Product Code	71

1. **Sourcing Output** - Source describes the current flow between the I/O module and the field device. Sourcing output circuits supply (source) current to sinking field devices. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. Field devices connected to the positive side (+V) of the field supply are sourcing field devices. *Europe:* DC sinking input and sourcing output module circuits are the commonly used options.
2. **Typical Loading Resistor -** To limit the effects of leakage current through solid state outputs, a loading resistor can be connected in parallel with your load. Use a 5.6K ohm, ½ watt resistor for transistor outputs, 24V dc operation.
3. **Recommended Surge Suppression** - Use a 1N4004 diode reverse-wired across the load for transistor outputs switching 24V dc inductive loads. For additional details, refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1.

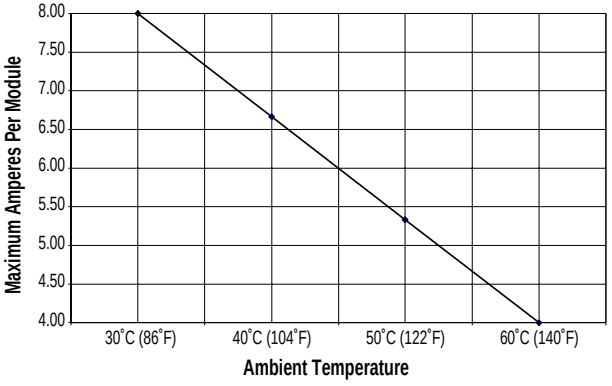
Temperature Derating

The area within the curve represents the safe operating range for the module under various conditions of user supplied voltages and ambient temperatures.

1769-OB16 Maximum Amperes Per Point vs. Temperature



1769-OB16 Maximum Amperes Per Module vs. Temperature



Transistor Output Transient Pulses

The maximum duration of the transient pulse occurs when minimum load is connected to the output. However, for most applications, the energy of the transient pulse is not sufficient to energize the load.

ATTENTION: A transient pulse occurs in transistor outputs when the external DC supply voltage is applied to the output common terminals (e.g. via the master control relay). The sudden application of voltage creates this transient pulse. This condition is inherent in transistor outputs and is common to solid state devices. A transient pulse can occur regardless of the controller having power or not. Refer to your controller's user manual to reduce inadvertent operation.

The graph below illustrates that the duration of the transient is proportional to the load current. Therefore, as the on-state load current increases, the transient pulse decreases. Power-up transients do not exceed the time duration shown below, for the amount of loading indicated, at 60°C (140°F).